

## **CLAIMS**

1. A water measurement apparatus comprising:  
a measurement circuit outputting a voltage;  
a processor operatively associated with the measurement circuit to receive the voltage and determine a capacitance value proportional to a water level; and  
computer readable program code provided in computer readable storage and executable by the processor, the computer readable program code including program code for determining the water level based on the capacitance value.
2. The water measurement apparatus of claim 1 wherein the measurement circuit includes an inner conductor and an outer conductor.
3. The water measurement apparatus of claim 2 wherein the inner conductor is surrounded by an insulating sheath.
4. The water measurement apparatus of claim 2 wherein the voltage is measured between the inner conductor and the outer conductor.
5. The water measurement apparatus of claim 2 wherein the capacitance value changes in proportion to the water height between the inner conductor and the outer conductor as indicated by the voltage.

6. The water measurement apparatus of claim 1 wherein the computer readable program code includes program code for determining a real component and an imaginary component of the voltage.
7. The water measurement apparatus of claim 1 further comprising program code for correcting the capacitance value for water conductivity.
8. The water measurement apparatus of claim 1 further comprising program code for correcting the capacitance value for water temperature.
9. The water measurement apparatus of claim 1 further comprising program code for correcting the capacitance value for water salinity.
10. The water measurement apparatus of claim 1 further comprising recording the water level and a corresponding sample time in the computer readable storage.
11. The water measurement apparatus of claim 1 further comprising a transmitter at a first station operatively associated with a receiver at a second station to deliver water measurement data including at least the water level from the first station to the second station.
12. The water measurement apparatus of claim 11 wherein the transmitter and the receiver are auto-networked with one another.

- 13.** An auto-network of water measurement stations comprising:
- at least a first and second water measurement station;
  - a capacitive water measurement device at the first water measurement station, the capacitive water measurement device determining a water level at the first water measurement station from a capacitance value based on a measured voltage; and
  - a transmitter at the first water measurement station operatively associated with a receiver at the second water measurement station, the transmitter delivering water measurement data based on the water level to the receiver at the second measurement station.
- 14.** The auto-network of water measurement stations of claim 13 wherein the water measurement data includes the water level and a corresponding sample time.
- 15.** The auto-network of water measurement stations of claim 13 wherein at least the first measurement station toggles between an active state and an inactive state to conserve power.
- 16.** The auto-network of water measurement stations of claim 13 wherein the first and second measurement stations toggle between an active state and an inactive state, the active state of the first measurement station overlapping in time with the active state of the second measurement station.

**17.** The auto-network of water measurement stations of claim 13 wherein the capacitive measurement device includes a measurement circuit outputting a voltage corresponding to the water level.

**18.** The auto-network of water measurement stations of claim 13 wherein the capacitive measurement device includes a processor executing computer readable program code including program code for determining the water level based on a measured voltage.

**19.** The auto-network of water measurement stations of claim 13 wherein the capacitive measurement device includes a measurement circuit outputting a voltage corresponding to the water level.

- 20.** A method comprising:
- measuring a voltage between an inner conductor and an outer conductor;
  - separating a real component and an imaginary component of the measured voltage;
  - converting the measured voltage to a capacitance value using the real and imaginary component of the measured voltage; and
  - determining the water level based on the capacitance value.
- 21.** The method of claim 20 further comprising determining a flow rate based on the capacitance value.
- 22.** The method of claim 20 further comprising determining a volume of water based on the capacitance value.
- 23.** The method of claim 20 wherein the capacitance value changes in proportion to changes in the water height between the inner conductor and the outer conductor.
- 24.** The method of claim 20 further comprising recording the water level and a corresponding sample time.
- 25.** The method of claim 20 further comprising transmitting water measurement data including at least the water level in an auto-network of water measurement stations.